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DEPENDENCE ON THE FLORAL CONTENT AND THE WEED NUMBER FROM GROWING SYSTEM IN OAT IN STRUMICA REGION

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Abstract: The main aim of this examination was to determine the dependence of the floral content and weed number from the growing system and to establish appropriate agro technical methods for reaching stable and high grain yields in conditions of conventional and organic production of oat. The examinations started in 2005 and lasted until 2007. In the experiment with conventional oat production ten (10) weed species were represent, and in organic experiment nine (9) weed species were represent. Considerate that plants in organic production, in all years of examination, in the initial growing stages, had faster vegetative growing, we could note that weed vegetation had more unfavorable growing conditions, and is less represented than the weed vegetation in the experiment with conventional growing system, without use of herbicides.

Key words: weeds, herbicides, oat, organic production, conventional production

D. SPASOVA, G. VASILEVSKI*, D. SPASOV, M. ILIEVSKI, B. ATANASOVA, University „Goce Delcev“ — Stip, Faculty of Agriculture, Goce Delcev b.b. 2400 Strumica, R. Macedonia, *St. Cyril and Methodius University — Skopje, Faculty of agricultural sciences and food, Aleksandar Makedonski b.b. 1000 Skopje, R. Macedonia. ЗАВИСИМОСТ НА БОТАНИЧНИЯ СЪСТАВ И БРОЯ ПЛЕВЕЛИ ОТ СИСТЕМАТА НА ОТГЛЕЖДАНЕ НА ОВЕС В РАЙОНА НА СТРУМИЦА

Резюме: Главната цел на това изследване беше да се определи зависимостта на ботаничния състав и броя плевели от системата на отглеждане и да се установят подходящи агротехнически методи за достигане на стабилен и висок зърнодобив в условията на обикновено и органично производство на овес. Изпитванията започнаха през 2005 г. и завършиха през 2007 г. В експеримента с обикновеното производство на овес бяха изследвани десет плевелни вида, а в органичния експеримент — девет плевелни вида. Растенията при органичното производство са имали през всички години на производство по-бърз вегетационен растеж в първоначалните фази на вегетация, като може да се забележи, че развитието на плевелите е било по-неблагоприятно и те са по-малко представени на брой в сравнение с експеримента, проведен при обикновени условия без използването на хербициди.

Ключови думи: плевели, хербициди, овес, органично производство, традиционно производство

INTRODUCTION

In Republic of Macedonia, the average grain yield from oat, in the period after the Second World War, is in continually decadence.

The main reasons for this problem are not productive varieties and inappropriate agrotechnical methods.

From the other side, today the oat is counted in the very important cultures in the human diet, with

increased call in the modern day culinary and the foodstuff technology. Gradually, the oat takes notably place in the human diet because it is the most nutritious cereal with big quantity of proteins in the grain. Besides the proteins the oat grain contain also soluble diet fibers as β -glucans, whose content varies from 2,5—6,5% (Pržulj et al. 1998). The content of β -glucans decreases the cholesterol in the blood, so today

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diet food recommends food on the base of oat flakes (Welch, 1991, cit: Mlinar 1996).

To increase and stabilize the yields, it is necessary to make systematical approach in the choice of high yield varieties, that will reach their genetic potencial in some soil and climatic conditions in the region, using appropriate agrotechnical measures.

Today, in Macedonia, the oat is grown on 2 162 ha (Statistical review: Agriculture 5.4.7.01/564, July 2007) and the average yield is 1746 kg/ha.

Because of the favorable climatic conditions that predominate in Strumica micro region, the favorable politics of our country in the last year for this culture, as well as the tradition that exist in this location, there are real chances to increase the surfaces with that culture in the next period, so the needs of the country would be satisfied, and the deficiency of that culture will be decreased.

One of the main factors in growing oat is weeds.

Besides the other analyses, in the same time we made an observation of the weeds in both growing systems, separately, by variants.

The main aim was to determine the dependence of the floral content and weed number from the growing system and to establish appropriate agro technical methods for reaching stable and high grain yields in conditions of conventional and organic production of oat.

MATERIAL AND METHODS

The examinations started in 2005 and lasted until 2007. The field experiments were set on the field of UGD, Faculty of agriculture, Strumica.

Five oat population, of which four are home population and one is introduced from Bulgaria (*population Krivogastani, population Trebenista, population Radolista, population from Bulgaria and population Kuceviste*), and three oat varieties (*Rajac, Slavuj and Lovken*) introduced from Serbia were analyzed.

In the three year examination two experiments were set (Fig. 1); one in condition of organic and one in condition of conventional production, in which all oat genotypes were maintained. The experiments



Fig. 1. Left, conventional — treated, right, organic - untreated

consisted of 8 variants in four repetitions, arranged by randomized block system, with dimension of the basic parcel of 5 m². The distance between variants is 50 cm, and between repetitions 100 cm.

The distance between lines at conventional production was 20 cm, and at organic production was 10 cm. In all years of examination culture before oat was potato.

In all years of examination the soil was prepared in the same way. During the autumn the surface was plowed in deepness of 35 cm, than the surface was separated and fertilized by methodological principle, so the surface predicted for conventional production was fertilized with 300 kg/ha NPK fertilizer in combination of 15:15:15, while the surface predicted for organic production, 20 t/ha organic fertilizer was inserted. After fertilizing the surface was additionally cultivated and was leveled.

The seed in all years of examination was done in March, 17.03.2005, 28.03.2006 and 06.03. 2007, when the conditions for seeding were optimal. The seeding was made by hand in rows, on 5—6 cm in deepness.

During the vegetation of oat, we made control of the weeds in organic and conventional production, for determining the number and species of the weeds. The number of the weeds was determined by the method of squares, i.e. by counting the weeds on 1m² of each repetition of each variant, and than the average of all repetitions is taken. After estimation of the weeds, the oat in stage tillering grown in conditions of conventional production was treated with herbicide 2,4 — D, against wide leaves weeds in the

RESULTS AND DISCUSSION

The floral content of the weed vegetation is brought out in table 1. From the made measurements and analyses it could be seen that in the organic production, in all years of examination 9 weed species are represented: *Papaver rhoeas, Veronica chederifolia, Stelaria media, Raphanus raphanistrum, Polygonum aviculare, Vicia Vilosa, Cirsium arvense, Equisetum arvense* and *Apera spica venti*. In the conventional production, in all years of examination 10 weed species are represented: *Papaver rhoeas, Veronica chederifolia, Stelaria media, Raphanus raphanistrum, Sinapis arvensis, Polygonum aviculare, Vicia Vilosa, Cirsium arvense, Equisetum arvense* and *Apera spica venti*.

Apart the varieties and populations, the average weediness of the experiment grown in conditions of organic production is 15, 15 weeds/m² in 2007, to 19,20 weeds/m² in 2005. The average weediness of the experiment grown in conditions of organic production of oat is 17, 20 weeds/m².

Apart the varieties and populations, the average weediness of the experiment grown in conditions of conventional production is 36,45 weeds/m² in 2007, to 42,95 weeds/m² in 2006. The average weediness of

Table 1/Таблица 1

Floral content of the weed vegetation in the experiment (No/m²)

Species of weeds	Organic production			Average 2005/07	Conventional production			Average 2005/07
	2005	2006	2007		2005	2006	2007	
<i>Papaver rhoeas</i>	3,50	3,25	3,25	3,33	6,25	6,50	5,25	6,0
<i>Veronica chederifolia</i>	3,55	1,80	1,20	2,18	4,75	4,80	4,50	4,68
<i>Stelaria media</i>	2,75	2,80	1,80	2,45	4,50	5,25	4,50	4,75
<i>Raphanus raphanistrum</i>	0,25	0,25	0,25	0,25	2,50	2,50	1,75	2,25
<i>Sinapis arvensis</i>	0,25	/	0,25	0,16	2,12	2,15	2,25	2,18
<i>Polygonum aviculare</i>	3,15	3,25	3,25	3,22	6,12	6,25	6,20	6,20
<i>Vicia villosa</i>	1,50	1,25	1,15	1,30	3,50	2,75	2,50	2,90
<i>Cirsium arvense</i>	1,00	0,75	0,75	0,83	3,50	3,75	3,25	3,50
<i>Equisetum arvense</i>	/	0,50	/	0,16	/	1,25	0,25	0,50
<i>Apera spica venti</i>	3,25	3,50	3,25	3,33	7,25	7,50	6,25	7,0
Total in 1 m ²	19,2	17,35	15,15	17,20	40,50	42,75	36,60	40,0
Total species	9	9	9		9	10	10	

the experiment grown in conditions of organic production of oat is 40,0 weeds/m².

Comparing the average weediness in both growing systems, apart the years, climatic conditions and variants, and depend of the used agro technical measures, it could be noted that the average weediness of the experiment grown in conditions of organic production (17,20 weeds/m²) is smaller absolutely for 22,8 weeds/m² or relatively for 132,6% from the average weediness of the experiment grown in conditions of conventional production (40,0 weeds/m²).

Considerate that plants in organic production, in all years of examination, in the initial growing stages, had faster vegetative growing, we could note that weed vegetation had more unfavorable growing conditions, and is less represented than the weed vegetation in the experiment with conventional growing system.

CONCLUSIONS

From the results the following conclusions could be made:

In conditions of conventional production of oat ten (10) weed species were represented, and in conditions of organic production nine (9) weed species were represented.

Apart the variants, the average weediness of the experiment grown in conditions of conventional production, in both years of examination is 40,0 weeds/m².

Apart the variants, the average weediness of the experiment grown in conditions of organic production, in both years of examination is 17,2 weeds/m².

The differences that appear in average weediness in both growing systems, are a result of use of different

agrotechnical measures, although the soil and climatic characteristics and the variants are same.

The agricultural measures used in conditions of organic production of cereal mixtures were better alternative solution for decreasing weeds, than those used in conventional production.

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